Addresses and sources of information Bicentennial projects 87, 329, 479; birds 37, 39; book programs 124-125; Concern Calendar 255; fencing 456; gardening 388, 393; hang gliding 291; Indian posters 348; Live Oak Society 94-95; metric information 158; Project Green Scene 175; Project Jonah 173; railroads 381; science 31; stamp collecting 459

Africa 89-93, 214, 248, 312, 334, 362, 367; map 268-269; see also Ghana; Kenya; South Africa;

Togo: Tunisia; and Wildlife

American Revolution Sam Adams 81-85; Benedict Arnold 74-77; Bicentennial observances 15, 86-87, 191, 264-265, 297, 326, 384, 476, 479, symbol 74, 326; First Continental Congress 15; women 328; "Yankee Doodle" 415

Animals albino 16, 63; babies 161-165, 175; extinct 416; "languages" 110-111; tagging 80, 478; tool users 58-61

Appleseed, Johnny 19, 26-29

Archeology 446-447; Chan Chan 433-437, 446; Denmark 389-391

Arlzona Indians 337, 338, 340, 343; Kitt Peak 383 Art painting 49, 53, 232, 329, 340; sand: castles 369-373, painting 349; sgraffito 206

Astronomy black hole 272; planets 296-299; telescopes 383; see also Sun

Australia 447; sports 152-153; wildlife 250-253 Austria medieval play-acting 130-133 Automobiles gasoline 414; steam 414-415 Bangladesh book aid 124-125

Bees 465-469

Bhutan prayer wheel 270 Birds 47, 170; babies 165, 175; barn owls 310-311, 439; birdhouse 46; dodos 416; falconry 132; feathers 438-439; gannets 200-201; Kangaroo Island 250, 251; migration 34-41, 201, 301,

303, 430; mythical 360-361; nests 440; ostriches 288; parrots 263; peacocks 439, 448; pelicans 300-301, 303; swans 366

Burma festival 360-361; hopscotch 334 Calendars 210-211, 223, 479; Concern 255 California 43, 142, 383; bicycling 102-103; hang gliding 292-293; medieval fair 130, 132-133; redwood tree 447; sand castles 369-373; Watts Towers 460-461

Canada Bonaventure gannets 200-201; polar diving 154-157; Quebec 74-77, 145-151 Canoes canoe making 6-9; trips 74-77

Cemetery exploration 382-383

Chan Chan Chimor Empire, Peru 433-437, 446 Chelsea Physic Garden London 362-365

Chesapeake Bay sailing 241-245; whale skull 63 Chile Cerro Tololo telescope 383

China hopscotch 334; jade 422-425; tangrams 254-255; Wushu troupe 10-13

Chinese immigrants 166-167; martial skills 10-13 Christmas 209-211, 218-221; crafts 184-185; giftgiving 211, 223; St. Lucia day 220, 221

Clothing Iron Age 14, 389; patchwork 264-265; tapa cloth 278, 279; see also Sandals

Colonial times games 334, 335; "living history" 321-325: women 326-329

Connecticut 120-121; Mystic Seaport 442-445 Conservation recycling 255, 376-377, 441; see also Ecology; Pollution prevention

Costa Rica 49-55; oxcarts 50, 53, 56-57

Cowboys Costa Rica 50-52; Wyoming 126-127 Crafts basketry 278; beadwork 65-69, 78; brooms 181; canoes 6-9; fences 321, 324; nets 134-137; pottery 42-45, 46, 432; shoes 376-377; tapa cloth 278; wool: carding 324, dyeing 120-121; see also Iron Age; Things to try; Toys

Dancers Indian 340-341, 349; Zulu 66-69 Denmark Iron Age village 14, 389-391 Deserts 394-395; jojoba shrub 479

Diving 171; abalone 118; polar 154-157 **Drummers** 384, 449-453

Ecology 60, 170; Concern Calendar 255

Ecuador fire balloons 176 Education American Indians 340, 342-343, 348, 350; black girls 327; see also Schools

Egypt 462; Christians 222; sun worship 18 Energy sources coal 398-399; gas 404; oil 312-317, 402, 404-407, 410; solar power 17-32

England London 174, 362-365, 366, chimney sweeps 398-399; Manx cats 192; mazes 335; medieval acting 129-133; net-making 134-137; sports 286; Thames River 366

English Channel youngest person to swim 191 Europe 455, 457; hopscotch 334; oil 312, 314-317

## SEND US YOUR NEW ADDRESS

If you move to a new permanent address this summer, write to National Geographic World giving both your old and new addresses so your September issue will reach you on time. Always use your zip code.

Explorers, discoverers, and navigators Ingólfur Arnarson 197; Jacques Cartier 200; John Colter 169; Matthew Flinders 250; Prince Henry 266-269; Lewis and Clark 169

Farming Burma 360; Canada 145-151; Colonial 321-325; Costa Rica 49-55; fieldworkers 138-141; hogs 160; Hunza 368; India 181, 182-183; Iron Age 389, 390; Korea 118-119; leisure 334; Mexico 202-203, 204; pumpkins 128; space 22-23; sugar beets 112; Togo 418, 419; Tunisia 246-247, 249; Vermont 331-332; vineyards 234; wheat maze games 335

Florida Big Cypress Swamp 36-37; sand castles 373; Seminole Indians 341, 342, 346-347

Flowers 464; begonias 311; drying 57; France 234, 235; sunflowers 32, 393

Foods and drinks apple cider 28; beer 419, 420: Christmas 219, 220; Colonial 322, 324, 325; French 230-231, 234; Ghana 62; India 180, 181, 182-183; Ireland 143; Iron Age 389, 390; Korea 115; sugar cane 53; sunflower seeds 393; Surinam 294-295; Togo 419, 420; tortillas 202, 203; wine 234; see also Fruits; Vegetables

Fossils fuel 20; triconodonts 207; whales 63 France 110-111, 225-240, 247, 248; bullfight 186-187; Chartres 212, 233; map 225; Paris 227, 229, 232, 233, 458; Pyrenees 97-101, 226, 227 Fruits 273, 274; apples 26-29, 118-119, 271;

bananas 50, 52, 276; grapes 225, 226, 234 Games chess 196, 197; Colonial 334, 335;

GeoGames 47, 159, 254-255, 335, 351; geography baseball 470-471; Kim's 95
Gardens and gardening 392-393; Chelsea 362-365; labyrints 335; youth 382-388
Germany 111, 112; Nürnberg 280-281
Ghana Operation Crossroads Africa 62
Gold panning 408-409
Grasslands North America 151, 353-359
Greece octopus fishing 188-189; Orthodox archbishop 214; Parthenon 374-375

## See history in motion

Colorful license plates with Bicentennial themes already brighten highways. And they teach, too. For example, Colorado's tags tell how the state's 100th birthday falls during the nation's 200th anniversary.



Hang gliding 289-292
Hawaii Christmas customs 210-211, 219; hang gliding 292; sand castles 372, 373
Hobbies crosswords 431; models: rockets 70, 72, trains 426-427; postage stamps 458-459; steam railroad trips 378-381
Hunza longevity 368
Iceland 193-199; Eldfell 208; map 195
Idaho Snake River 168-170
India Dera: spiritual colony 177-183

Indians of North America 26, 28, 32, 64, 286, 334, 337-352, 354, 356, 359; alphabet 350; crafts 6, 9, 344, 348-349; languages 350-351; shelters 346-347; tribal map 344-345 Insects bee-lining 465-469; beetles 395; butter-

flies 32, 464 Iran 401-407

Ireland medieval play-acting 142-143; oil 314, 315
Iron Age village Denmark 14, 389-391

Israel 213, 221, 222

Italy 110-111; Pompeii 286

Jade 422-425

Japan oil 312, 313, 314; printing 185; swimming 286; Tamba pottery 42-45; whaling 171, 172 Kenya sandals 376-377; wildlife 88-93, 162-163 Korea North and South 113-119; map 114

Languages American Indian 350-351; animal talk 110-111; English 350; French 99-101, 110-111, 146, 226-240; Surinam 294

Livestock 325, 331-332; brands 462-463; cattle 51, 53, 54-55, 126-127; horses 51, 126-127, 129, 130, 146-147, 276, 345; pigs 160, 165; sheep 120-121, 337, 338

Maine bees 465-469; canoe trip 74-77

Mammals bats 165, 400; bulls 186-187; dogs 343;

Manx cats 192; mice 4; polar bears 164, 165; ponies 198, 199, 305-309; reindeer 224; tigers 16; triconodonts 207; see also Livestock; Marine life; Wildlife

Marine life algae 20-21; mammals: porpoises 171, 173, 480, sea otters 58-61, seals 251-253, whales 171-173, 224, 479; mollusks: abalones 58-61, 118, cockles 311, octopuses 123, 188-189, oysters 143; museum 122-123; polar study 154-157; reptiles: sea turtles 478-479

Maryland Bicentennial 384; exploring land 302; "Hodgepodge Lodge" 262-263; jousting 142-143; St. Michaels 243, 244; women 326, 329

Massachusetts Boston 81-85; oyster study 143; Uncle Sam 190

Medicine Indian medicine men 64, 349; women in 329; see also Plants: medicine

Metal detectors 474

Mexico 462; Chichén Itzá 446; Christmas 185, 219; Metepec potters 432; octopus fishing 188-189; Vicente Guerrero (village) 202-205

Middle Ages alchemy 318-319; re-creating 129-133, 142-143; town 280-281

Mississippi Beulah 138-141; grasslands 356
Monaco Oceanographic Museum 122-123
Montana buffalo 353, 354; fossii 207; Indians 350
Mountains and mountain climbing 367; Bighorn

Mountains and mountain climbing 367; Bighorn 126-127; Jura 287; Pyrenees 97-101; Teton 168 Mystic Seaport Connecticut 442-445

Myths bird 360-361; Icarus 292; Roland 97-101 National Geographic Society books 37; expeditions 6-9, 171, 207, 434; films 86-87

National Park Service canoe exhibit 6; Project Green Scene 175; Turkey Run Farm 321-325 Negro history education 327; slavery 140, 302, 327; women 327

New Jersey Black River & Western Railroad 378-381; women in history 328



New Mexico 219, 220-221; Indians 343, 346
New York 326, 328; Adirondack steamer 396-397,
399; New York City 215, Chinese 166-167
Newsfaces 63, 191, 271, 367
Newspapers 271, 326, 329, 336
North America 338, 340, 343, 345; flyways 40-41;
oil 313, 315; religious haven 215, 217, 218, 223;

see also Indians of North America; Wildlife
North Carolina hang gliding 289, 290, 292; Old
Salem 218-219

Norway 111, 197; Runde 410-411 Ohio Cincinnati Zoo: tigers 16

Oregon Mount Hood 367; Snake River 168-170 Parthenon Athens 374-375; Nashville 374-375

Pennsylvania Bethlehem 218; Kutztown: quilting bee 265; Philadelphia 15

Performing arts 191, 271; martial skills 10-13, 407; medieval acting 129-133, 142-143
Persian Gulf map 405; oil 312-317, 407

Peru Chan Chan 433-437, 446
Philippines tree houses 440
Photography children's 104-109; nature 38-39; polar underwater 154-157
Photosynthesis algae 20-21; sunflowers 32
Plants algae 20-21; crops 128, 138-139, 202-203, 204, 323, 324; grasslands 151, 353-359; medicine 64, 311, 318-319, 362-363, 365; millet 418, 419, 420; shamrocks 311; tea 406; terrariums 175, 392-393; used in wool dyeing 120-121
Pollution prevention 143, 255, 362, 366, 414-415

FIRST IN FREEDOM

OOO 5000

NO RTH CAROLI NA

Portugal bullfight 186-187; Prince Henry 266-269 Presidents, U. S. Calvin Coolidge 330-333; Abraham Lincoln 319; women candidates 327, 329 Pseudo-science 446-447

Pseudo-science 446-447
Puerto Rico Ponce; La Playa 104-109
Railroads 378-381, 396-397; model 426-429
Religions American Indians 341, 346; ancient
374-375; Buddhism 270, 380; Christianity 210222, 267, 276, 329, map 216-217; Islam 247, 248.

222, 267, 276, 329, map 216-217; Islam 247, 248; Judaism 404; Shinto 44; Togo: spirit belief 421, 431

Reptiles sea turtles 478-479; snakes 14, 257-263 Rivers and river trips Apple 412-413; Big Fork 6-7, 9; Mara 92; Miles 243, 244-245; Nile 222; Rhône 240; Seine 226, 227; Snake 168-170; Thames 366; U. S.-Canada 74-77 Salling 241-245, 267, 442-443

Sandals made from tires 376-377 Schools Bangladesh 124-125; China 12, 13; France 237; India 181-183; medical 329; navigation 266, 267, 269, school ship 443;

nursing 329 Sherlock Holmes 174

Ships supertankers 312-317, 405, 407; treasure 410; Viking 196-197; see also Sailing; Steam Smithsonian Institution 39, 63, 265 South Africa, Republic of Zulus 65-69, 78-79 Space 70-73, 199, 297, 299; farm 22-23



Spain 111; bullfight 186-187; Pyrenees 97-101 Spiders tarantulas 256 Sports baseball 339; basketball 207; bicycling

102-103; bullfights 186-187; canoeing 74-77; fencing 454-457; football 152-153, 334; hiking 97-101; ice skating 320; inner tube float 412-413; jousting 129-133, 142-143; lacrosse 345; ostrich race 288; "sea boxers" 96; soccer 48, 205; swimming 191, 282-286; tennis 136-137 Steam autos 414-415; railroads 378-381; ships 238, Tucanon 36, 297, 398.

238, *Tuscarora* 396-397, 399 Sun 17-21, 24-25, 32, 296-297 Surinam Paramaribo market 294-295

Switzerland 206; Geneva 367; Swiss Jura 287 Tennessee Parthenon 374-375

Texas 287, 382; wolf-coyote hybrid 164
Thailand "sea boxers" 96
Things to try (Why pot?) 46, 56-57, 110-

Things to try (Why not?) 46, 56-57, 110-111, 120-121, 175, 184-185, 264-265, 348-349, 392-393, 440-441 see also Games; Hobbies

Togo 417-421, 431; location map 419 Toys 280-281, 334, 335, 426-429

Trees 440-441; baobab 88, 89, 447; bark 6-9, 278, 279; coconut 274, 275, 277-278; elms 430; live oaks 94-95; rings 441

Tunisia 246-249; French rule 247 Turkey Run Farm Virginia 321-325 United States Congress 329; gas 312; oil 312, 315; Supreme Court 327, 336; Uncle Sam 190



Utah white pelicans 300-301, 303
Valentines business 329; in nature 310-311
Vegetables 112, 360, 385-388, 392-393
Vermont home of Calvin Coolidge 330-333
Virginia 128, 213; Fredericksburg 474; schools 14, 257-259, 264-265; Turkey Run Farm 321-325; wildlife 38-39, 304; Williamsburg 449-453; women in history 328

Wars women's role 326-329; Zulu 78-79
Washington, D. C. buffalo 359; Kennedy Center
10-13; youth gardens 385-388; zoo 16
Weather drought 355, 356, 359; rain 394-395;

snowflakes 303

Wildlife Africa 90-93, camels 246-247, chimpanzees 161, giraffes 1-5, lions 89, 162-163, 165; Australia 250-253; North America: buffalo 353, 354-355, 356, 359, cougar 80, ferret 144, wolfcoyote hybrid 164, woodchucks 304

Wisconsin apples 271; elm disease 430; inner tube float 412-413; Menominee Indians 338-339 Women in history 326-329; suffrage 329

World Mappemonde (1459) 268-269; oil routes 312-313; spread of Christianity 216-217

Wyoming cattle roundup 126-127; Snake River

168-170; women's vote 329 Zulus 65-69, 78-79; King Shaka 69, 78-79

Dear Reader — You helped us launch a new magazine. You sent in many story ideas and suggested more than 1,000 new names for the Bulletin. In return we offer you a World of thanks (pages 472-473).